

A NEW CRUCIFER FROM
THE GREAT SLAVE LAKE AREA OF CANADA

REED C. ROLLINS

A general problem of classification in the Cruciferae results from the lack of sharp definitive boundaries between the genera in some sections of the family. This problem has long been recognized. The situation is readily understood and should perhaps even be expected because of the relatively short evolutionary history of the family. However, an understanding of the situation does not alleviate the torment that ensues whenever an unknown species is found that does not quite fit well-established genera. The uncertainty as to which genus might be involved requires that all possible genera be carefully checked and studied to determine whether or not the species has been described in any one of them. This in itself is a much longer and more laborious process than if the species were clearly referable to a well known and well defined genus. Furthermore, the unknown species is usually not closely related or readily comparable to a known species and thus the comparative procedures usually employed in fitting such a species into a classificatory scheme are not applicable.

For over a year, we have been periodically concerning ourselves with material of just such an unknown species. Four collections of it were made by John W. Thieret and Robert J. Reich, along the Yellowknife Highway near Great Slave Lake of northwestern Canada, during June and July of 1961. A fifth collection was made in August, 1962, by Thieret. The plants grow in marshy to wet situations and develop relatively large lateral roots. The petiolate basal leaves with more or less crenate margins are reminiscent of *Armoracia aquatica* or possibly horseradish, *Armoracia rusticana*, but there the similarity stops. The long, slender, wide-spreading pedicels suggest *Rorippa nasturtium-aquaticum*. However, other features, such as the undivided leaves and uniseriate seeds, make a close association of the plant in question with watercress untenable. All characteristics considered, the new species does fall more nearly within the group of species making up *Rorippa* than any



Plate 1271. Silhouette photograph of two fertile specimens and one sterile specimen of *Rorippa crystallina*, $\times 2/5$. The specimen at right and the sterile specimen make up a part of the holotype sheet.

other genus known to me, even though no single species can readily be singled out for easily handled comparative purposes.

An interesting feature of the new species is the basis for the specific epithet chosen, *crystallina*.¹ Relatively large crystals of calcium oxalate are found in the inner tissues of the fleshy leaves, the stems, pedicels and fruits. These crystals occupy several adjacent cells and are large enough to erupt the leaf-surface when the plants are pressed flat in drying them for specimen purposes. According to Metcalfe and Chalk² calcium oxalate crystals are rare in the Cruciferae. These authors indicate that crystals are present in *Crambe* and *Sisymbrium* but *Rorippa* is not mentioned as a genus in which calcium oxalate crystals have been observed. The number and distribution of crystals in *Rorippa crystallina* is variable. These crystals may be clustered or widely spaced, associated with or near vascular bundles, or remote from them. There is no evident association with vascular trace endings in the leaves. In the larger basal leaves, the crystals are more prominent and more numerous on the lower side of the leaf than on the upper. They are more numerous per unit of area in the smaller cauline leaves than in the basal leaves and give a pustular appearance to the leaf-surface, both above and below. Generally, they are more prominent on the lower surface than on the upper.

***Rorippa crystallina* Rollins, sp. nov. Plate 1271**

Perennial, glabrous throughout; roots thick, often well-developed laterally; stems one to several, erect to decumbent, glabrous, 1-4 dm. long, arising below an active fascicle of leaves, unbranched except in the inflorescence; basal leaves borne on short shoots, fascicled, petiolate, ovate to narrower, obtuse, shallowly and coarsely dentate, blade 4-10 (-20) cm. long, 1.5-4 (-6) cm. wide, cuneate at base, petioles 3-8 (-12) cm. long, winged above; lower cauline leaves petiolate, narrowly oblanceolate, obtuse, 4-6 cm. long, 4-10 mm. wide, dentate, toothed or lobed, petiole winged; upper cauline leaves sessile, overlapping, lanceolate to nearly oblong, narrowed at base, entire to sparsely dentate, thick when fresh; all leaves more or less pustular on both

¹I am indebted to Professors I. W. Bailey and Adriance S. Foster for cleared leaves, tests for calcium oxalate and shared observations on the material. My appreciation goes to Dr. John W. Thieret for providing ample material upon which this study is based.

²Anatomy of the Dicotyledons, Vol. 1, p. 82. 1950.

surfaces from the presence of relatively large crystals present in the mesophyll; individual stems terminated by a short raceme 5-10 (-15) cm. long, occasional flowering branches just below main inflorescence; sepals yellowish-green, non-saccate, broadly oblong, 4-5 mm. long; petals spatulate, whitish, sometimes tinged below with light lavender, 6-8 mm. long, ca. 3 mm. wide; stamens tetradynamous. anthers oblong, ca. 1 mm. long; fruiting pedicels slender, spreading at right angles to somewhat ascending, 12-18 mm. long, slightly enlarged at apex; siliques terete, 1.5-2.5 cm. long, widely spreading to somewhat ascending, nearly sessile or with a short thick gynophore less than 0.5 mm. long; valves with a central inconspicuous branching nerve; styles ca. 1 mm. long; stigmas slightly bilobed with lobes over the replum; ovules 10-15 in each loculus; funiculi free, rather spongy; septum with a prominent central nerve-like area extending full length down the middle, cells of the septum prominent, usually hexagonal; seeds plump, broadly oblong, wingless, 1.5-2 mm. long, ca. 1.2 mm. broad; seed-coat finely reticulate-colliculate, covered with a mucilaginous sheath, buff-colored when dry, beak curved into a short hook, funiculus detached at hilum leaving a circular scar, funicular appendage absent; cotyledons accumbent.

Herba perennis caespitosa glabra, caulibus erectis vel decumbentibus 1-4 dm. longis; foliis pustulatis, basilaribus fasciculatis petiolatis, laminis ad basim cuneatis ovatis vel anguste-ovatis dentatis 4-10 cm. longis, 1.5-4 cm. latis; foliis caulinis inferne crassis petiolatis anguste oblanceolatis dentatis vel lobatis; foliis caulinis superne sessilibus crassis integris vel sinuato-dentatis obtusis; sepalis nonsaccatis obtusis 4-5 mm. longis; petalis spathulatis albis vel albido-lilacinis 6.5-8 mm. longis; pedicellis in fructu divaricatis tenuis 12-18 mm. longis; siliquis teretibus divaricatis 1.5-2.5 cm. longis; stylis ca. 1 mm. longis; seminibus oblongis immarginatis 1.5-2 mm. longis; cotyledonibus accumbentibus.

Type in the Gray Herbarium collected in a *Carex* marsh at mile 23 N., along the Mackenzie River - Yellowknife Highway, northwest of Great Slave Lake, District of Mackenzie, Northwest Territories, Canada, July 10, 1961, *John W. Thieret and Robert J. Reich* 7512.

Other specimens studied, all from the same general area, and deposited in the Gray Herbarium: mile 23.8 N., June 14, 1961, *Thieret and Reich* 6637; mile 35 N., July 7, 1961, *Thieret and Reich* 7413; mile 16.5 N., July 9, 1961, *Thieret and Reich* 7484; mile 23.5 N., Aug. 9, 1962, *Thieret* 9085. — GRAY HERBARIUM, HARVARD UNIVERSITY.